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Research Paper

Effect of turmeric along with proximate nutrients of broiler chicks

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Abstract : The experiment was conducted at the Livestock Production and management unit, Department of N.R.M Faculty of agriculture MGCGV Chitrakoot - Satna M.P. To complete the research work following steps were followed. Freshly hatched, apparently healthy, day old straight run 225 commercial broiler chicks (Cobb strain) were procured on 18thApril, 2022 from Government Poultry Farm, for the present study. Routine, day old vaccinations for (Fl strain) disease were given to the chicks just after hatching. On 14th day all the chicks were vaccinated against Infectious Bursal Disease also. On 2nd day all the chicks were wing banded, individually weighed and randomly divided into 4 treatment groups excluding one that of control. Each group having 45 broiler chicks, was further sub-divided into 3 replicates of 15 chicks. In the group (T₁) prebiotic as Bio-Mos, a product of Alltec Inc. incorporation, at the rate of 1000 ppm of feed to give an active concentration of 0.01% in the feed. In the group (T₂), probiotic was mixed with ration at the rate of 100 g/ton of feed to give an active concentration of 0.01% in the feed. In the group (T₃) a herbal product turmeric (*Curcuma longa*), was mixed with ration at the rate of 1000 ppm. To give an active concentration of 0.1% in the feed. In the same rates as in treatment groups alone. Based on results it was concluded that turmuric powder has none -significant effect on the body weights, feed intake, gain in weight and feed efficiency of broilers. Based on feed efficiency best performance of broilers was observed in supplemented with 0.1 per cent tumuric powder, followed by 0.01 per cent tumuric powder, All treatments were economically better than control.

Key Words : Broiler chicks, Growth performance, Turmeric powder

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INTRODUCTION

Poultry sector in India has developed as an Unprecedented growth during the last three decade and now has transformed itself into the status of an industry. it now plays as a very important role in the economic development of the country. it has transited from home consumption to commercial production. the poultry farming occupies an important position due to its encourage potential to bring about rapid economic growth, particularly benefiting the weaker section due to its low investment requirement in India (Anonymous 2014) this sector provides a great employment opportunity even to unskilled laborers labours and women there by providing income to the vulnerable group. today,

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poultry is one of the fastest growing segments of the agriculture sector in India rising at a rate of 8-10 per cent par annum as compared to agriculture crop (1.5 to 2% parent par annum) and rank 3rd in egg production (Chatterjee and Rajkumar, 2015) about 3 million farmers and 15 million agrarian farmers are employed in the poultry industry that grows product (Karthikeyan and Nedunchezhian, 2013). the major factor for successful poultry production are high genetic potential, balanced nutrition and health maintenance. On the other hand, there is a major demand to produce high quality poultry meat and egg at low price without relaying on antibiotic and other medicines in poultry feed and water (Shivappa-Nayaka et al., 2012). The optimum performance of broiler bird is mainly dependent on the genetic potential of bird, quality of feed, environmental condition and disease outbreaks (Sugiharto, 2016). Presently uses of food additives are in ideal tools to boost the profit of poultry farmers. Use of antibiotics as growth promoters in poultry and animal feed has been banned in the European union science January 2006. A number of workers had revealed the use of bioactive plant and additives in poultry feed. Beneficial effect of bioactive plant substance in animal nutrition may include the stimulation of appetite and feed intake, the improvement in endogenous digestive enzyme secretion activation of immune response and antibacterial antiviral and antioxidant action (Toghyani, 2010) due to its medicinal properties, the use of turmeric in poultry feed become extensive during the last decade (Khan et al., 2012). Bis demthoxy Cucurmin (BDMC) and demthoxy Cucurmin (DMC) collectively referred to as curcuminoids which act as powerful antioxidant and a clorless metabolite namely tetra hydro Cucurmin (THC) (Huang et al., 1995) cucurminoids (3 to 5 % as found in turmeric powder) have a wide spectrum of biological activities including antioxidant, antibacterial, antifungal antiprotozoal, antiviral, anticoccidial and antyinflammatory property (Masuda et al., 2001) turmeric has good pharmacological properties and can be a useful natural growth promoter and safe alternative to antibiotic. dietary supplementation of curcumin is limited because of its low solubility in alkaline pH and being subject to hydrolysis when exposed to light, which result in poor absorption in animal (Kochhar, 2008) studies on broiler chicken have sown increased weight gain and improved FCR (Samarasinghe et al., 2003) with dietary supplementation of turmeric in country, gowda et al. (2008) and Kumari et al. (2007) mehala and Moorthy (2008). Curcuma longa is a rhizomatous perpetual plant of the Ginger family, Zingiberaceae. turmeric rhizomes is a rich source of bioactive compounds utilised nonmedicinally as a spice and medicinally as medical remedies. When compared to commercially available antibiotic, turmeric is a safe, non- toxic and ideal food additive widely used in daily diet. The active ingredients are tetrahydrocurcumin (Osawa et al., 1995).

MATERIAL AND METHODS

The present experiment entitled "Effect of Turmeric along with proximate nutrients of broiler chicks" was carried out in small animal laboratory of Department of N.R.M. Faculty of Agriculture, Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya, Chitrakoot, Satna (M.P.).

Experimental chicks and their management :

Freshly hatched, apparently healthy, day old straight run 225 commercial broiler chicks (Cobb strain) were procured on 18th April, 2022 from Government Poultry Farm, for the present study. Routine, day old vaccinations for (F₁ strain) disease were given to the chicks just after hatching. On 14th day all the chicks were vaccinated against Infectious Bursal Disease also. On 2nd day all the chicks were wing banded, individually weighed and randomly divided into 4 treatment groups excluding one that of control. Each group having 45 broiler chicks, was further sub-divided into 3 replicates of 15 chicks.

Mixing of standard broiler ration (basal diet) :

Each fresh and dry wheat straw was used as bedding material. In each pen one 250 watt bulb was placed 1 and V-i feet above the level of litter for brooding purpose. The temperature for brooding was controlled by increasing or decreasing the height of bulb. A photoperiod of 24 hours duration was provided throughout the experimental period for all eight groups. All the chicks were reared under identical standard management practices like brooding, feeding, watering, lighting, health care etc. during the entire course of study.

Treatments used in the experiment :

- T_1 -Basal diet + Prebiotic
- T₂-Basal diet + Probiotic
- T₃-Basal diet + Turmeric
- T_4^{2} -Basal diet + Prebiotic + Probiotic + Turmeric In the group (T_1) prebiotic as Bio-Mos, a product

of Alltec Inc. incorporation, at the rate of 1000 ppm of feed to give an active concentration of 0.1 % in the feed.

In the group (T_2) , probiotic was mixed with ration at the rate of 100 g/ton of feed to give an active concentration of 0.01% in the feed.

In the group (T_3) a herbal product turmeric (*Curcuma longa*), was mixed with ration at the rate of 1000 ppm. To give an active concentration of 0.1% in the feed.

In the group (T_4) a combination of prebiotic (Bio-Mos) and probiotic was incorporated with ration at the same rates as in treatment groups alone.

RESULTS AND DISCUSSION

The results of the investigation regarding the growth performance of broiler chicks have been presented in the preceding chapter, with the help of tables and graphical illustration, wherever required. The findings are discussed in this chapter.

Weekly average body weight of broilers :

The data regarding average weekly body weight of broilers are presented in Table 1 and Fig. 1. It may be noted that irrespective of treatments mean body weight per broiler in first week, second, third and fourth week was 106.82, 251.95, 525.55, And 935.98 g, respectively. Similarly the mean weekly body weight of broilers in T_0 , T_1 , T_2 , T_3 , and T_4 irrespective of week was 423.96, 470.52, 489.74, 457.52 and 433.60 g, respectively and the differences were significant. Results showed that

supplementation in ration caused significant increase in growth resulting in higher body weight, however, it was so in broilers of T_2 and T_1 weekly body weight of broilers of control were not significantly different for broilers of T_3 and T_4 . Mean weekly body weight of broilers of T_4 were also at per with broilers of T_3 as the differences were not significant at 5% level.



Fig. 1 : Average weekly body weight (g) of broilers of different treatments

Average gain in weight of broilers (g) :

In general highest mean weight gain per broiler was



Fig. 2 : Average weekly weight gain (g) of broilers in five different treatments

Weeks	Week body weight (g) of broilers of different treatments						
	T ₀	T ₁	T ₂	T ₃	T ₄	— Mean	
W_1	107.44	107.33	107.99	109.33	101.99	106.82	
W ₂	246.22	259.55	268.44	250.00	235.55	251.95	
W ₃	471.77	556.44	578.89	531.77	488.88	525.55	
W_4	870.44	958.78	1003.67	939.00	907.99	935.98	
Mean	423.96	470.52	489.74	457.52	433.60	455.08	

Table 2 : Average weekly weight gain (g) of broilers in five different treatments

Weeks	Week wise average weight gain (g) of broilers in different treatments						
WEEKS	T ₀	T1	T ₂	T ₃	T_4	Mean	
W_1	67.78	67.33	68.89	70.66	61.11	67.15	
W ₂	138.67	152.22	160.45	140.67	133.56	145.11	
W ₃	225.55	296.89	310.45	281.78	253.33	273.60	
W_4	398.67	402.33	424.78	407.22	399.11	406.42	
Mean	207.668	229.693	241.143	225.083	211.778	223.07	

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observed in T_2 followed by T_1 , T_3 , T_4 and T_0 . This showed increase in ration the gain in weight of broilers also increased and it was significant compared to control.

Average feed intake/feed consumption of broilers (g) :

The results of feed intake revealed that feed intake increased with age of broilers and it was as expected. A significant effect supplementation was noted in feed



Fig. 3: Average weekly feed consumption (g) of broiler in five different treatment

intake of broilers as the differences from control were not significant. Mean feed consumption per week was significant in broilers of T_2 than broilers of To and T_1 ; however differences in weekly feed intake of broiler were significantly less different from broiler of T_3 , and T_4 Compared with the control.

Feed conversion ratio (FCR) / Feed efficiency in broilers:

Irrespective of treatment the FCR of broilers in first,



Fig. 4 : Average weekly feed conversion ratio of broiler in different treatments

Table 3 : Averag	e weekly feed consumpti	on (g) of broiler in fiv	e different treatment				
Weeks	Average feed consumption of broiler in different treatments						
	T ₀	T_1	T_2	T ₃	T_4	Mean	
\mathbf{W}_1	100.00	100.00	111.11	105.55	105.55	104.44	
W_2	231.33	267.55	277.66	239.11	238.89	250.91	
W_3	462.66	506.00	533.55	490.66	491.78	496.93	
W_4	669.40	804.00	863.67	771.00	633.33	748.28	
Mean	365.848	419.388	446.498	401.58	367.388	400.14	

Weeks	Average weekly feed conversion ratio of broiler in different treatments						
	T ₀	T ₁	T ₂	T ₃	T_4	Mean	
W_1	1.49	1.48	1.62	1.49	1.76	1.57	
W ₂	1.73	1.74	1.72	1.71	1.79	1.74	
W ₃	2.23	1.7	1.75	1.74	1.93	1.87	
W_4	1.68	2.05	2.05	1.93	1.64	1.87	
Mean	1.78	1.74	1.79	1.72	1.78	1.76	

Parameters			Treatments T ₂	T ₃	T ₄	Results
rarameters	T ₀	T ₁				
Body weight of DOC(g)	39.77	40.00	39.11	38.67	40.88	NS
Body weight at four week of age (g)	870.44	958.78	1003.67	939.00	907.99	S
Average gain in weight per broilers during four weeks of age (g)	398.67	402.33	424.78	407.22	399.11	NS
Feed intake per broilers (g) in four weeks	669.40	804.00	863.67	771.00	633.33	S
FCR (kg)	1.78	1.74	1.79	1.72	1.78	NS

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second, third and fourth week was 1.57, 1.74, 1.87 and 1.87, respectively. Overall FCR of broiler was 1.797. Irrespective of week the weekly FCR of broilers in T_0 , T_1 , T_2 . T_3 . And T_4 was 1.78, 1.74, 1.79, 1.72 and 1.78, respectively, It may be noted that FCR in broilers due to treatments and also due to weeks was not found Significant.

The mean body weight of broilers at four week of age in T_0 , T_1 , T_2 , T_3 and T_4 was 870.44g, 958.78g, 1003.67g, 939.00g and 907.99 g, respectively. The differences in body weight of broilers of four weeks age were not significant.



Fig. 4 : Average weekly feed conversion ratio of broiler in different treatments

- The mean gain weight of broilers at four week of age in treatments T_0 , T_1 , T_2 , T_3 and T_4 was 398.67g, 402.33g, 424.78g, 407.22g and 399.11 g, respectively. The differences between gain in weight among the treatments were not significant (P<0.05).

- The mean feed intake per broilers in treatments T_0 , T_1 , T_2 , T_3 and T_4 during four week of age was 669.40g, 804.00g, 863.67g, 771.00g and 633.33g, respectively and the differences in feed intake of broilers between treatments were not significant.

- The mean feed conversion ratio of broilers per treatments T_0 , T_1 , T_2 , T_3 and T_4 during four week of age was 1.68, 2.05, 2.05, 1.93 and 1.64, respectively. Differences in FCR of broilers between treatments were not significant.

Conclusion:

Based on results it was concluded that turmuric powder has non-significant effect on the body weights, feed intake, gain in weight and feed efficiency of broilers. Based on feed efficiency best performance of broilers was observed in supplemented with 0.1 per cent tumuric powder, followed by 0.01 per cent tumuric powder, All treatments were economically better than control.

REFERENCES

Anonymous (2014). *Poultry industry*. Department of Food Processing, Punjab, India .

Brugalli (2003). Biochemical profile and meat characteristics of broiler rabbits under ojnsummer stress . *Veterinary World* , **4** : 15-18 .

Chatterjee, R.N. and Rajkumar, U. (2015). An overview of poultry production in India . *Indian J.Animal Health*, **54** (2) : 89-108.

Gowda, N.K.S., Ledoux, D.R. Rottinghaus, G Eiom, Bermudez, A. J. and Chen, Yc (2008). Efficacy of turmeric (*Curcuma longa*), containing a known level of curcumin, and a hrydred sodium calcium aluminosilicate to amcliorate the adverse effect of aflatoxin in broiler chicks. J. Poultry Sci., 87: 1125-1130.

Hossain, D.M.N (2016). Effects of tulsi leaf body weight gain in broiler production. *Bangladesh J. Veterinary Medicine*, 14 (1): 21-25.

Huang, M.T., Ma, W., Lu, Y.P. Chang, R.L., Fisher, C. Manchand, P.S., Newmark, H.L., Canney, A.H. and You, M. (1995). Effect of curcumin, demethoxycurcumin bisdemethoxy Cacumin and tetrahydrocurcumin on 120 - tradecanoylphorbel - 13 - acetateinduced tumor promotion, *Carcinogenesis*, 16 : 2493-2497.

Karthikeyan, R. and Nedunchezhian, V.R. (2013). Vertical integration paving way to organised retailing in Indian Poultry industry. *International J. Business & Management Invention*, 2 (1): 39-46.

Khan, R.U., Naz, S., Javdani, M., Nikousefat, Z., Selvaggi, M., Tufarelli, V. and Laudadio, V. (2012). The use of turmeric (*Curcuma longa*) in poultry feed. *Worlds Poultry Science J.*, 68:97-103.

Kochhar, K.P. (2008). Dietary spices in health and diseases (II) Indian . *Indian J. Physiology & Pharmacology*, **52** (4) : 327-354.

Kumari, P. Gupta, M.K., Ranjan, R., Singh, K.K. and Yadava, R. (2007). Curcuma longa as feed additive in broiler birds and its pathophysiologi.cal effect. *Indian J. Exp. Biol.*, **45**: 272-277.

Masuda, T., Mackawa, T., Hidaka, K., Bando, H., Takeda, Y. and Yamaguchi, H. (2001). Chemical studies on antioxidant mechanism of curcumin : Analysis of oxidative coupling products from curcumin and linoleate, *J. Agriculture Food & Chemistry*, 49 : 2539-2547.

Mehala, C. and Moorthy, M. (2008). Production performance of broilers fed with *Aloe vera* and *Curcuma longa* (turmeric). *International J. Poultry Sciences*, **7**(9): 852-856.

Osawa, T., Sugiyama, Inayoshi, M. and Kawakishi, S. (1995).

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Antioxidative activity of tetrahydrocurcuminoids. *Bioscience, Biotechnology & Biochemistry*, **59** (9) : 1609-1612.

Shivappa Nayaka, H.B., Umakantha, B., Wilfred, R.S., Murthy, H.N.N. and Narayanaswamy, H.D. (2012). Effect of neem turmeric, vitamin E and their combination of immune response in broiler. *Global Veterinarian*, 9 (4): 486-489.

Sugiharto, S. (2016). Role of nutraceuticals in gut health and

growth performance of poultry. *J. Saudi Society of Agriculture Science*, **15** (2): 99-111.

Toghyani, M.M., Toghyani, A.A., Gheisari Ghalamkari, G. and Mohammadrezaci, M. (2010). Growth performance, serum biochemistry and blood hematology of broiler chicks fed different levels of black seed (*Nigella sativa*) and peppermint (*Mentha piperita*). *Livestock Sciences*, **129**: 173-178.

